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In 81
65

FOREST CONTROL

by

CONTINUOUS INVENTORY

"Today I have grown taller from walking
with the trees."

...Karle Wilson

Milwaukee, Wis. August, 1959 No. 65

MORE PROOF OF THE PUDDING

FROM MINNESOTA AND ONTARIO PAPER CO. EXPERIMENTAL FOREST

John Hubbard of Mando has contributed another interesting item on growth after deliberate forest improvement measures over a period of 10 years. The record comes from 558 permanent 1/10-acre plots in a research forest in northern Minnesota.

Weather conditions were similar in the two 5-year growth periods, during which over-ripe stands were harvested and intermediate cuttings were made. Over 200,000 board feet of sawlogs were sold and 7,000 cords of pulpwood taken to the plant from the area between 1949 and 1958. In addition, these net increments were recovered.

GROWTH PER ACRE PER YEAR IN CORDS

Item	Period	Period
	1949 - 1953	1954 - 1958
Survivor Growth	.380	.376
Ingrowth	.092	.107
Gross Increment	.472	.483
Natural Mortality	.220	.151
Net Increment	.252	.332

These figures show a 31% reduction in mortality and a net growth increase of 32%. Applied to the company's quarter million acres, this rate of growth would represent an increase of 200,000 cords of pulpwood in 10 years' time.

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CAL STOTT



STANDARD CORRECTION

FACTORS

BY

SPECIES

TO BE APPLIED WHEN
CALCULATING INDIVIDUAL
TREE VOLUMES IN UNITS OF

PILED CORDS
CUBIC FEET
BOARD FEET

W.W. BARTON
GEORGE SEMMENS
CAL STOTT

AUGUST 1959

TABLE 1

STANDARD SPECIES CORRECTION FACTORS
FOR CALCULATING INDIVIDUAL TREE VOLUMES IN CUBIC FEET

When using composite cubic foot volume tables a correction is needed for variations in bark thickness by species. These variations range from a double bark thickness of 4.4% of DBH outside bark in beech, to 12.5% in black walnut. The basic information for these factors comes from Technical Note No. 108 published by the Lake States Forest Experiment Station. Bark thickness percentages for species not covered in this reference were assumed. All values are intended primarily for pulpwood size trees up to 12" DBH.

SPECIES		DOUBLE BARK THICKNESS IN % OF DBH - OB	SPECIES CORRECTION FACTORS
Beech		5%	1.04
Black spruce	Red cedar	6%	1.02
White spruce	Black gum		
Red spruce	Balsam fir		
Paper birch	Pin oak	7%	1.00
River birch	Ironwood		
N. Wh. Cedar	Tamarack		
Red maple	Silver maple	8%	.98
Black ash	Yellow poplar		
Sycamore	Wild blk. cherry		
Yellow birch	Misc. species		
The elms	Willow	9%	.96
The aspens	Catalpa		
Cypress	Mulberry		
Magnolia	White ash		
Ailanthus	Green ash		
Sugar maple	Box elder		
Balm of Gilead	Cottonwood		
The hickories	Honey locust		
Basswood	Red gum	10%	.94
Jack pine	Buckeye		
Blk. jack oak	Buttermut		
Burr oak	Sassafras		
Post oak	Hackberry		
White ash	Scarlet oak		
Norway pine	N. pin oak		
Black locust	Shingle oak		
Chestnut oak	Pitch pine		
Loblolly pine	Scotch pine		
Virginia pine	Overcup oak		
Short leaf pine	Ky. coffee tree		
Swamp white oak			
Hemlock	Red oak	11%	.93
White pine	White oak		
Black oak	Black walnut		

All values to be improved as better information is secured.

TABLE 2

STANDARD SPECIES CORRECTION FACTORS
FOR CALCULATING INDIVIDUAL TREE VOLUMES IN STANDARD CORDS

"In a pile of straight, cylindrical bolts about 19 cubic feet is air space. Because of uneven taper, which makes it difficult to pile bolts in perfect formation, on the average 11 cubic feet in addition are lost in piling. Thick, short bolts pack better than long slender ones. Such factors as crookedness and roughness further reduce the solid content of a stack. In addition, deductions for settling and shrinkage average 5% to 8%. The necessary deductions must be carefully calculated and applied to gross estimates of volume before a cruiser can hope to make his final estimates check satisfactorily."

From TIMBER CRUISING, by Girard and Gevorkiantz

SPECIES		SPECIES CORRECTION FACTORS	DESCRIPTION OF WOOD
Black spruce	Red pine	1.00	Clean, straight wood of good form and low taper.
White spruce	White pine		
Red spruce	Loblolly pine		
Balsam fir	Short leaf pine		
Tamarack	Cypress	1.05	Moderately clean straight wood of average form and taper.
Basswood	Hemlock		
Jack pine	Ironwood		
The aspens	Pitch pine		
Virginia pine	Paper birch		
Balm of Gilead	Yellow birch		
Yellow poplar			
Beech	Magnolia	1.10	Below average in cleanness, straightness, form and taper.
Pin oak	Burr oak		
Red oak	Black oak		
Sycamore	Hackberry		
White oak	Cottonwoods		
Black gum	Scarlet oak		
River birch	Scotch pine		
Black walnut	The hickories		
Overcup oak			
Willow	Ailanthus		
Catalpa	Black ash	1.15	Very rough, crooked, poor form wood with heavy taper.
Post oak	Sassafras		
The elms	N. pin oak		
Butternut	Shingle oak		
Red cedar	Honey locust		
Box elder	Chestnut oak		

All values to be improved as better information is secured.

TABLE 3

STANDARD SPECIES CORRECTION FACTORS
FOR CALCULATING INDIVIDUAL TREE VOLUMES IN BOARD FEET

Species correction factors are needed for sawlog trees as well as cordwood trees and for the same reasons. There are extremes of tree form and differences in bark thickness to account for in the determination of the true board foot volumes of trees. These factors are taken from special studies by the Lake States Forest Experiment Station and the Central States Forest Experiment Station, and cover the principal species only. Values for the minor species were assumed.

SPECIES	SPECIES CORRECTION FACTORS	SPECIES	SPECIES CORRECTION FACTORS
Beech		Basswood	.98
Pin oak	1.15	Cottonwood	.97
Black gum		White pine	
Yellow poplar	1.13	Balsam fir	.96
Red oak	1.10	N. pin oak	
Overcup oak		Catalpa	
Chinquapin oak	1.08	Black ash	.95
Swamp white oak		Box elder	
White oak		Cypress	
Black oak	1.07	Sycamore	
Scarlet oak	1.06	Sassafras	
The hickories		The aspens	.93
The elms	1.05	Paper birch	
Norway pine		River birch	
Loblolly pine	1.04	Balm of Gilead	
Short leaf pine		Eastern hemlock	.92
Blue ash		Tamarack	
Magnolia		Jack pine	
White ash	1.03	Butternut	
Green ash		Pitch pine	
Shingle oak		Red spruce	.90
Chestnut oak		Scotch pine	
Red gum		White spruce	
Burr oak		Black walnut	
Post oak		Virginia pine	
Buck eye		Willow	
Mulberry	1.00	Red cedar	
Hackberry		N. white cedar	.80
The maples		Black jack oak	
Yellow birch		Miscellaneous	
Honey locust			
Black locust			
Ky. coffee tree			
Wild black cherry			

All values to be improved as better values are secured.

A CALCULATED EXAMPLE OF THE APPLICATION OF SPECIES CORRECTION FACTORS
TO CORDWOOD TREES
For Use with the CFI System

The Basic Facts

Species	Beech
DBH	6"
Usable length	24'
The "a" factor from Newsletter 55	.218
The "b" factor from Newsletter 55	.11593
The cubic foot species factor from this newsletter	1.04
Cubic feet per standard cord from Newsletter 54	79.
The cord species factor from this newsletter	1.10

The Problem Compute unpiled cubic feet uncorrected for bark thickness

The Formula $V_{pcu} = a + (b \times L)$
 $V_{pcu} = .218 + (.11593 \times 24)$
 $V_{pcu} = 3.000$ cubic feet uncorrected

The Problem Compute unpiled cubic feet corrected for bark thickness

The Formula $V_{pcu} = [a + (b \times L)] (1.04)$
 $V_{pcu} = [.218 + (.11593 \times 24)] (1.04)$
 $V_{pcu} = 3.000 \times 1.04$
 $V_{pcu} = 3.120$ cubic feet corrected

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The Problem Compute piled cords uncorrected for form, roughness and taper.

The Formula $V_{pcd} = [a + (b \times L)] + 79$
 $V_{pcd} = [.218 + (.11593 \times 24)] + 79$
 $V_{pcd} = 3.000 + 79$ or .038 cords uncorrected

The Problem Compute the piled cords corrected for form, roughness and taper.

The Formula $V_{pcd} = [a + (b \times L)] \times 1.10 + 79$
 $V_{pcd} = [.218 + (.11593 \times 24)] \times 1.10 + 79$
 $V_{pcd} = .038 \times 1.10$ or .042 cords corrected

Note that this formula uses the unpiled cubic feet volume (.218) uncorrected.